UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,713	06/22/2006	Henning Wiemann	P18512-US1	9826

27045 7590 08/04/2009

ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR 1-C-11
PLANO, TX 75024

EXAMINER	
FIALKOWSKI, MICHAEL R	
ART UNIT	**PAPER NUMBER**
2419	

MAIL DATE	DELIVERY MODE
08/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,713	WIEMANN ET AL.	
	Examiner	Art Unit	
	MICHAEL FIALKOWSKI	2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *37-72* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *37-72* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to amendments filed May 4, 2009. Claims 1-36 are cancelled and Claims 36-72 are pending.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 37,55, and 71 are rejected under 35 U.S.C. 102(b) as being anticipated by Meyer et al (EP 1249972 A1).

Re claim 37, Meyer et al discloses a method of controlling a queue buffer in a data unit transmission device, the queue buffer being arranged to queue data units in a queue and being connected to a link, the method comprising the steps of: determining a value of a length parameter related to the length of the queue [0040],(in Meyer et al [X] refers to paragraph [X]); comparing the value with a length threshold value [0042]; performing a congestion notification procedure with respect to one or more data units from the queue if the value is greater than the length threshold value [0042]; estimating, by an automatic threshold adaptation procedure, a link capacity value based on the data rate of the link and adapting the threshold value on the basis of the estimated link capacity value [0043] (uses estimate worst scenario time over link [0063]), wherein the

automatic threshold adaptation procedure is operable in one of at least a first and a second adaptation mode (uses two thresholds [0062]), the first adaptation mode being associated with minimizing queuing delay and adapting the threshold value on the basis of n*LC (minimum threshold is calculated by setting equal to LC, therefore an arbitrary number of 1 could applied as n [0062]), where LC represents the estimated link capacity value and n>=1, and the second adaptation mode being associated with maximizing utilization and adapting the threshold value on the basis of m*LC, where m>1 and m>n (max threshold can be calculated from LC times a constant epsilon which can be from 3-6, therefore greater than 1 and greater than the above constant [0066]).

Re claim 55, Meyer et al discloses a queue buffer controller (unnamed but performs the functions of) for controlling a queue buffer [0036] in a data unit transmission device, the queue buffer being arranged to queue data units in a queue and being connected to a link, comprising: a queue length determinator for determining a value of a length parameter related to the length of the queue [0040], a comparator for comparing the value with a length threshold value [0042]; a congestion notifier for performing a congestion notification procedure if the value is greater than the length threshold value [0042]; and a threshold adaptor for automatically adapting the length threshold value by estimating a link capacity value [0043] based on the data rate of the link and adapting the length threshold value on the basis of the estimated link capacity value (uses estimate worst scenario time over link [0063]), wherein the threshold adaptor is operable in one of at least a first and a second adaptation mode (uses two thresholds [0062]), the first adaptation mode being associated with minimizing queuing

delay and adapting the threshold value on the basis of n*LC (minimum threshold is calculated by setting equal to LC, therefore an arbitrary number of 1 could applied as n [0062]), where LC represents the estimated link capacity value and n>=1, and the second adaptation mode being associated with maximizing utilization and adapting the threshold value on the basis of m*LC, where m>1 and m>n (max threshold can be calculated from LC times a constant epsilon which can be from 3-6, therefore greater than 1 and greater than the above constant [0066]).

Re claim 71, Meyer et al discloses the controller wherein the queue buffer is arranged to hold at least a first queue and a second queue (queue buffer provides a plurality of queues [0068]) , the threshold adaptor is arranged for adapting a first threshold value associated with the first queue in accordance with the first adaptation mode and adapting a second threshold value associated with the second queue in accordance with the second adaptation mode (each queue is associated with a given flow, and each queue is managed in accordance with its own control parameters [0068] – [0069]).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 38,39,42,44-47,49-53,56,57,60, 62-65, and 67-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al (6,535,482).

Re claim 38, Meyer et al discloses the method of claim 37 as stated above, but Meyer et al does not explicitly disclose wherein the queue buffer is arranged for receiving data units from a sender that performs window-based flow control and divides its send window by k, k>1, when receiving a congestion notification or when detecting data unit loss, wherein n=k-1 and m=k^2-1. However Hadi Salim et al teaches wherein the queue buffer is arranged for receiving data units from a sender that performs window-based flow control (TCP source reduces the window to control the flow [6,9-12] , herein [X,X] in Hadi Salim et al refers to [Column, Line(s)]) and divides its send window by k, k>1, (source reacts by halving the congestion window (therefore an arbitrary k would equal 2 [6,39-42]) when receiving a congestion notification (ECN-notify set in the

header means source knows there is congestion [6,39-42]) or when detecting data unit loss, wherein n=k-1 and m=k^2-1 (if the arbitrary k is 2 as taught by Hadi Salim et al, then n=1, as disclosed by Meyer et al above, and m=3, as disclosed by Meyer et al above). It would have been obvious for one of ordinary skill in the art in the area of controlling congestion in a network to include window-based flow control as taught by Hadi Salim et al in the method of Meyer et al in order to handle transient congestion.

Re claim 39, note that Meyer et al modified by Hadi Salim et al teaches the method wherein k=2, n=1 and m=3 (if the arbitrary k is 2 as taught by Hadi Salim et al as stated above, then n=1, as disclosed by Meyer et al above, and m=3, as disclosed by Meyer et al above).

Re claim 42, Meyer et al modified by Hadi Salim et al teaches the method of claim 38, but does not explicitly disclose detecting potential data unit losses outside of the data unit transmission device in a flow queued in the queue buffer using a loss indication event detection procedure. However, Hadi Salim et al teaches detecting potential data unit losses outside of the data unit transmission device in a flow queued in the queue buffer using a loss indication event detection procedure (ISQ sending process) (if the packet is discarded due to the random early detection, an ISQ sending process is invoked [7,35-40]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of controlling congestion in a network to include a loss indication event detection procedure as taught by Hadi Salim et al in the modified method of Meyer et al in order to account for packets lost during routing from one end point to another end point.

Re claim 44, Meyer et al modified by Hadi Salim et al teaches the method of claim 42 as stated above, but does not explicitly disclose the step of monitoring loss indication information in acknowledgement data units sent from a receiver of the queued flow to the sender of the queued flow during the loss indication event detection procedure. However, Hadi Salim et al teaches the step of monitoring loss indication information (TCP source determines if the EC notify bit has been set [11,23-27]) in acknowledgement data units sent from a receiver (if an ACK is received [11,20-27]) of the queued flow to the sender of the queued flow during the loss indication event detection procedure (response arranged to occur with flow control [11,20-27]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of congestion control in a network to include monitoring loss indication information in acknowledgement data units as taught by Hadi Salim et al in the modified method of Meyer et al in order to account for packet loss in a network.

Re claim 45, Meyer et al modified by Hadi Salim et al teaches the method of claim 42 as stated above, but does not explicitly disclose the steps of: counting a number of data unit loss indication events occurring outside of the data unit transmission device in the queued flow using a counting procedure; and deriving a characteristic count value from the counted numbers in a procedure. However, Hadi Salim et al further teaches the steps of counting a number of data unit loss indication events (incrementing a counter ECN_ACC by the level of congestion [8,43-50]) occurring outside of the data unit transmission device in the queued flow using a counting procedure (counter may be incremented from ISQs from successive packets,

before the end of the window [8,54-57]); and deriving a characteristic count value from the counted numbers in a procedure (counter reflects the number of the congestion notifications received over a time period for a given flow [8,45-50]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of congestion control in a network to include counting loss indication information by using a counting procedure as taught by Hadi Salim et al in the modified method of Meyer et al in order to account for packet loss in a network.

Re claim 46, Meyer et al modified by Hadi Salim et al teaches the method of claim 45 as stated above, and Meyer et al further discloses wherein determining the loss events in each of p respective predetermined intervals, p being a natural number (threshold triggering event can be chosen at regular intervals and started by a counter [0048] [0050]), but does not explicitly disclose wherein the procedure for deriving a characteristic count value determines the number of loss indication events occurring outside of the data unit transmission device in the queued flow and selecting the maximum among the numbers as the characteristic count value. However, Hadi Salim et al teaches wherein the procedure for deriving a characteristic count value determines the number of loss indication events occurring outside of the data unit transmission device in the queued flow (incrementing a counter ECN_ACC by the level of congestion, [Hadi Salim et al 8,43-50]) and selecting the maximum among the numbers as the characteristic count value (selecting the maximum of a congestion index if a CE bit has been set previously [8,4-10] and having multiple values of incrementing due to the severity of the congestion [8,61-67]). It would have been obvious for one of ordinary

skill in the art at the time of the invention in the area of controlling congestion in a network to determine a characteristic count and choose a maximum value as taught by Hadi Salim et al in the modified method of Meyer et al in order to account for the maximum congestion in a network.

Re claim 47, Meyer et al modified by Hadi Salim et al teach the method of claim 46, but does not explicitly disclose wherein the predetermined intervals are defined as the time between two consecutive decisions of performing a congestion notification for a data unit in the queued flow. However, Hadi Salim et al further teaches wherein the predetermined intervals are defined as the time between two consecutive decisions of performing a congestion notification for a data unit in the queued flow (counter need only be compared to a threshold at the end of the window, where a window is a given amount of time or packets [8,55-60]). It would have been obvious at the time of the invention for one of ordinary skill in the art to use predetermined time intervals as taught by Hadi Salim et al in the modified method of Meyer et al in order to meet standards and ensure compatibility with receivers (Hadi Salim et al [8,50-55]).

Re claim 49, Meyer et al modified by Hadi Salim et al teach the method of claim 45, and Meyer et al further discloses the step of accounting for an outcome of the loss indication event detection procedure by the automatic threshold adaptation procedure (when a link loses connectivity, the procedure increases the length threshold value of another link, for example in a 1st mode, by a constant fc, which would fall under the 2nd mode [0071]).

Re claim 50, Meyer et al modified by Hadi Salim et al teaches the method of claim 49, but does not explicitly disclose the step of the automatic threshold adaptation procedure accounting for an outcome of the loss indication event detection procedure when dynamically adapting the threshold value in the first or the second adaptation mode. However, Hadi Salim et al teaches the step of the automatic threshold adaptation procedure accounting for an outcome of the loss indication event detection procedure when dynamically adapting the threshold value in the first or the second adaptation mode (if it is determined from the ISQ that the congestion is severe, then a rapid response is made, otherwise a more measured gradual algorithm is carried out [8, 30-35]). It would have been obvious at the time of the invention for one of ordinary skill in the art to account for the loss indication event detection procedure when dynamically adapting the threshold value as taught by Hadi Salim et al in the modified method of Meyer et al in order to accurately account for changes in network congestion.

Re claim 51, Meyer et al modified by Hadi Salim et al teaches the method of claim 50, but does not explicitly disclose the congestion notification procedure deciding, in a decision step, whether to perform a congestion notification procedure with respect to one or more data units, which decision step depends on the outcome of the loss indication event detection procedure. However, Hadi Salim et al teaches the congestion notification procedure deciding, in a decision step (steps 230,240,250 [7, 35-50]), whether to perform a congestion notification procedure (ISQ sending process may be invoked [7,40-45]) with respect to one or more data units (incoming packet) , which decision step depends on the outcome of the loss indication event detection procedure

(depending on whether the packet is chosen by the RED process for marking [7,40-45]). It would have been obvious at the time of the invention for one of ordinary skill in the art to perform a congestion notification procedure as a result of a loss indication event detection procedure as taught by Hadi Salim et al in the modified method of Meyer et al in order to improve fairness of congestion notification (Hadi Salim et al [7,45-55]).

Re claim 52, Meyer et al modified by Hadi Salim et al teaches the method of claim 51, but does not explicitly disclose the step of monitoring whether an event that indicates a potential data unit loss in a queued flow occurs within a predetermined period of time after it is detected that the value of the length parameter related to the length of the queue is greater than the length threshold value, and the decision step comprises not performing a congestion notification if an event indicating a potential data unit loss occurs within the predetermined period of time, and otherwise performing the congestion notification. However, Hadi Salim et al teaches the step of monitoring whether an event that indicates a potential data unit loss in a queued flow occurs within a predetermined period of time (counter reflects the number and severity of congestion notifications received over a time period [8, 44-50]) after it is detected that the value of the length parameter related to the length of the queue is greater than the length threshold value (average queue length is greater than a threshold [7, 35-45]) , and the decision step comprises not performing a congestion notification (downstream routers would not be allowed to send ISQs if the CE bit is already set [8, 13-17]) if an event indicating a potential data unit loss occurs within the predetermined period of time, and otherwise performing the congestion notification (congestion level is derived from the

congestion level in the router and ISQ is generated [7, 63-67]). It would have been obvious at the time of the invention for one of ordinary skill in the art to monitor events that indicate a potential data unit loss and not perform a congestion notification if the potential data unit loss occurs within the predetermined period of time as taught by Hadi Salim et al in the modified method of Meyer et al in order to warrant more balance (Hadi Salim et al [8,13-16]).

Re claim 53, Meyer et al modified by Hadi Salim et al teaches the method of claim 52 as set forth above, and Meyer et al further discloses wherein the queue buffer is arranged to hold at least a first queue and a second queue (queue buffer provides a plurality of queues [0068]) , the automatic threshold adaptation procedure adapting a first threshold value associated with the first queue in accordance with the first adaptation mode and adapting a second threshold value associated with the second queue in accordance with the second adaptation mode (each queue is associated with a given flow, and each queue is managed in accordance with its own control parameters [0068] – [0069]).

Re claim 56, Meyer et al discloses the controller of claim 55 as stated above, but Meyer et al does not explicitly disclose wherein the queue buffer is arranged for receiving data units from a sender that performs window-based flow control and divides its send window by k, k>1, when receiving a congestion notification or when detecting data unit loss, wherein n=k-1 and m=k^2-1. However Hadi Salim et al teaches wherein the queue buffer is arranged for receiving data units from a sender that performs window-based flow control (TCP source reduces the window to control the flow [6,9-12])

and divides its send window by k, k>1, (source reacts by halving the congestion window (therefore an arbitrary k would equal 2 [6,39-42]) when receiving a congestion notification (ECN-notify set in the header means source knows there is congestion [6,39-42]) or when detecting data unit loss, wherein n=k-1 and m=k^2-1 (if the arbitrary k is 2 as taught by Hadi Salim et al, then n=1, as disclosed by Meyer et al above, and m=3, as disclosed by Meyer et al above). It would have been obvious for one of ordinary skill in the art in the area of controlling congestion in a network to include window-based flow control as taught by Hadi Salim et al in the controller of Meyer et al in order to handle transient congestion.

Re claim 57, note that Meyer et al modified by Hadi Salim et al teaches the controller wherein k=2, n=1 and m=3 (if the arbitrary k is 2 as taught by Hadi Salim et al as stated above, then n=1, as disclosed by Meyer et al above, and m=3, as disclosed by Meyer et al above).

Re claim 60, Meyer et al discloses the controller of claim 55, but does not explicitly disclose a loss indication event detector detecting potential data unit losses outside of the data unit transmission device in a flow queued in the queue buffer using a loss indication event detection procedure. However, Hadi Salim et al teaches a loss indication event detector (unnamed hardware [11,39-51]) detecting potential data unit losses outside of the data unit transmission device in a flow queued in the queue buffer using a loss indication event detection procedure (ISQ sending process) (if the packet is discarded due to the random early detection, an ISQ sending process is invoked [7,35-40]). It would have been obvious for one of ordinary skill in the art at the time of the

invention in the area of controlling congestion in a network to include a loss indication event detection procedure as taught by Hadi Salim et al in the controller of Meyer et al in order to account for packets lost during routing from one end point to another end point.

Re claim 62, Meyer et al modified by Hadi Salim et al teaches the controller of claim 60 as stated above, but does not explicitly disclose a monitor for monitoring loss indication information in acknowledgement data units sent from a receiver of the queued flow to the sender of the queued flow during the loss indication event detection procedure. However, Hadi Salim et al teaches a monitor for (unnamed hardware [11,39-51]) monitoring loss indication information (TCP source determines if the EC notify bit has been set [11,23-27]) in acknowledgement data units sent from a receiver (if an ACK is received [11,20-27]) of the queued flow to the sender of the queued flow during the loss indication event detection procedure (response arranged to occur with flow control [11,20-27]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of congestion control in a network to include monitoring loss indication information in acknowledgement data units as taught by Hadi Salim et al in the modified controller of Meyer et al in order to account for packet loss in a network.

Re claim 63, Meyer et al modified by Hadi Salim et al teaches the controller of claim 60 as stated above, but does not explicitly disclose a counter for counting a number of data unit loss indication events occurring outside of the data unit transmission device in the queued flow using a counting procedure; and a count number

processor deriving a characteristic count value from the counted numbers in a procedure. However, Hadi Salim et al teaches a counter for counting a number of data unit loss indication events (incrementing a counter ECN_ACC by the level of congestion [8,43-50]) occurring outside of the data unit transmission device in the queued flow using a counting procedure (counter may be incremented from ISQs from successive packets, before the end of the window [8,54-57]); and a count number processor deriving a characteristic count value from the counted numbers in a procedure (counter reflects the number of the congestion notifications received over a time period for a given flow [8,45-50]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of congestion control in a network to include counting loss indication information by using a counting procedure as taught by Hadi Salim et al in the modified controller of Meyer et al in order to account for packet loss in a network.

Re claim 64, Meyer et al modified by Hadi Salim et al teaches the controller of claim 63 as stated above, and Meyer et al further teaches determining the loss events in each of p respective predetermined intervals, p being a natural number (threshold triggering event can be chosen at regular intervals and started by a counter [0048] [0050]), but does not explicitly disclose wherein the count number processor determines the number of loss indication events occurring outside of the data unit transmission device in the queued flow and selecting the maximum among the numbers as the characteristic count value. However, Hadi Salim et al teaches wherein the count number processor determines the number of loss indication events occurring outside of the data

unit transmission device in the queued flow (incrementing a counter ECN_ACC by the level of congestion, [Hadi Salim et al 8,43-50]) and selecting the maximum among the numbers as the characteristic count value (selecting the maximum of a congestion index if a CE bit has been set previously [8,4-10] and having multiple values of incrementing due to the severity of the congestion [8,61-67]). It would have been obvious for one of ordinary skill in the art at the time of the invention in the area of controlling congestion in a network to determine a characteristic count and choose a maximum value as taught by Hadi Salim et al in the modified method of Meyer et al in order to account for the maximum congestion in a network.

Re claim 65, Meyer et al modified by Hadi Salim et al teaches the controller of claim 64, but does not explicitly disclose wherein the predetermined intervals are defined as the time between two consecutive decisions of performing a congestion notification for a data unit in the queued flow. However, Hadi Salim et al teaches wherein the predetermined intervals are defined as the time between two consecutive decisions of performing a congestion notification for a data unit in the queued flow (counter need only be compared to a threshold at the end of the window, where a window is a given amount of time or packets [8,55-60]). It would have been obvious at the time of the invention for one of ordinary skill in the art to use predetermined time intervals as taught by Hadi Salim et al in the modified controller of Meyer et al in order to meet standards and ensure compatibility with receivers (Hadi Salim et al [8,50-55]).

Re claim 67, Meyer et al modified by Hadi Salim et al teaches the controller of claim 60, and Meyer et al further discloses the threshold adapter for automatically

adapting the length threshold value (unnamed but performs the functions of) is arranged for taking an output of the loss indication event detector into account (when a link loses connectivity, the procedure increases the length threshold value of another link, for example in a 1st mode, by a constant fc, which would fall under the 2nd mode [0071]).

Re claim 68, Meyer et al modified by Hadi Salim et al teaches the controller of claim 60, but does not explicitly disclose the threshold adaptor is arranged for taking an output of the loss indication event detection procedure into account for dynamically adapting the threshold value in the first or the second adaptation mode. However, Hadi Salim et al teaches the threshold adaptor (unnamed but performs the functions of) is arranged for taking an output of the loss indication event detection procedure into account for dynamically adapting the threshold value in the first or the second adaptation mode (if it is determined from the ISQ that the congestion is severe, then a rapid response is made, otherwise a more measured gradual algorithm is carried out [8, 30-35]). It would have been obvious at the time of the invention for one of ordinary skill in the art to account for the loss indication event detection procedure when dynamically adapting the threshold value as taught by Hadi Salim et al in the modified controller of Meyer et al in order to accurately account for changes in network congestion.

Re claim 69, Meyer et al modified by Hadi Salim et al teaches the controller of claim 60, but does not explicitly disclose the congestion notifier comprises a decision unit for deciding, whether to perform a congestion notification with respect to one or more data units, which decision unit is arranged for taking into account an output of the

loss indication event detector. However, Hadi Salim et al teaches the congestion notifier comprises a decision unit for deciding (steps 230,240,250 [7, 35-50]), whether to perform a congestion notification (ISQ sending process may be invoked [7,40-45]) with respect to one or more data units (incoming packet) , which decision unit is arranged for taking into account an output of the loss indication event detector (depending on whether the packet is chosen by the RED process for marking [7,40-45]). It would have been obvious at the time of the invention for one of ordinary skill in the art to perform a congestion notification procedure as a result of a loss indication event detection procedure as taught by Hadi Salim et al in the modified controller of Meyer et al in order to improve fairness of congestion notification (Hadi Salim et al [7,45-55]).

Re claim 70, Meyer et al modified by Hadi Salim et al teaches the controller of claim 69, but does not explicitly disclose the loss indication event detector is arranged for monitoring whether an event that indicates a potential data unit loss in a queued flow occurs within a predetermined period of time after it is detected that the value of the length parameter related to the length of the queue is greater than the length threshold value, and the decision unit is arranged to not perform a congestion notification if an event indicating a potential data unit loss occurs within the predetermined period of time, and otherwise performing the congestion notification. However, Hadi Salim et al teaches the loss indication event detector (unnamed but performs the functions of) is arranged for monitoring whether an event that indicates a potential data unit loss in a queued flow occurs within a predetermined period of time (counter reflects the number and severity of congestion notifications received over a time period [8, 44-50]) after it is

detected that the value of the length parameter related to the length of the queue is greater than the length threshold value (average queue length is greater than a threshold [7, 35-45]) , and the decision unit is arranged to not perform a congestion notification (downstream routers would not be allowed to send ISQs if the CE bit is already set [8, 13-17]) if an event indicating a potential data unit loss occurs within the predetermined period of time, and otherwise performing the congestion notification (congestion level is derived from the congestion level in the router and ISQ is generated [7, 63-67]). It would have been obvious at the time of the invention for one of ordinary skill in the art to monitor events that indicate a potential data unit loss and not perform a congestion notification if the potential data unit loss occurs within the predetermined period of time as taught by Hadi Salim et al in the modified controller of Meyer et al in order to warrant more balance (Hadi Salim et al [8,13-16]).

5. Claims 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al as applied to claims 38 above, and further in view of Minhazuddin et al (2004/0073641).

Re claim 40, Meyer et al modified by Hadi Salim et al teaches the method of claim 38 as set forth above, but does not explicitly teach the step of setting the first adaptation mode or the second adaptation mode manually by an operator. However Minhazuddin et al teaches the step of setting a first adaptation mode (normal state) or second adaptation mode (detailed monitoring state) manually by an operator (user) [0030]. It would have been obvious for one of ordinary skill at the time of the invention

to set a first or second mode by an operator as taught by Minhazuddin et al in the method of the modified Meyer et al in order to change modes if the session quality falls below a certain level (Minhazuddin et al [0030]).

Re claim 41, Meyer et al modified by Hadi Salim et al teaches the method of claim 38 as set forth above, but does not explicitly teach the step of automatically setting the first adaptation mode or the second adaptation mode using an automatic mode setting procedure. However, Minhazuddin et al teaches of setting the first adaptation mode (normal state) or the second adaptation mode (detailed monitoring state) using an automatic mode setting procedure (automatically) [0030]. It would have been obvious for one of ordinary skill at the time of the invention to set a first or second mode automatically as taught by Minhazuddin et al in the method of the modified Meyer et al in order to change modes if the session quality falls below a certain level (Minhazuddin et al [0030]).

6. Claims 58 and 59 rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al in view of Minhazuddin.

Re claim 58, Meyer et al discloses the controller of claim 55 as set forth above, but does not explicitly teach the setting mechanism of the first adaptation mode or the second adaptation mode by an operator. However Minhazuddin et al teaches the setting a first adaptation mode (normal state) or second adaptation mode (detailed monitoring state) manually by an operator (user) [0030]. It would have been obvious for one of ordinary skill at the time of the invention to set a first or second mode by an operator as

taught by Minhazuddin et al in the controller of Meyer et al in order to change modes if the session quality falls below a certain level (Minhazuddin et al [0030]).

Re claim 59, Meyer et al discloses the controller of claim 55 as set forth above, but does not explicitly teach the automatic mode setting mechanism for setting the first adaptation mode or the second adaptation mode automatically. However, Minhazuddin et al teaches of setting the first adaptation mode (normal state) or the second adaptation mode (detailed monitoring state) using an automatic mode setting (automatically) [0030]. It would have been obvious for one of ordinary skill at the time of the invention to set a first or second mode automatically as taught by Minhazuddin et al in the controller of Meyer et al in order to change modes if the session quality falls below a certain level (Minhazuddin et al [0030]).

7. Claims 48 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al as applied to claims 45 and 63 above, and further in view of Liao et al (2004/0136379).

Re claim 48, Meyer et al modified by Hadi Salim et al teaches the method of claim 45, but does not explicitly disclose deriving a characteristic count value determines an average number of loss indication events occurring outside of the data unit transmission device in the queued flow as the characteristic count value. However, Liao et al teaches of determining an average number of loss indication events (average packet loss rate [0073]) occurring outside of the data unit transmission device in the queued flow (in queues [0073]) as the characteristic count value (uses the count to

compare with a threshold [0073]). It would have been obvious at the time of the invention for one of ordinary skill in the art to include the average number of loss indication events in the modified method of Meyer et al in order to take into account a steadier, long term loss indication.

Re claim 66, Meyer et al modified by Hadi Salim et al teaches the controller of claim 63, but does not explicitly disclose a count number processor determines an average number of loss indication events occurring outside of the data unit transmission device in the queued flow as the characteristic count value. However, Liao et al teaches of a count number processor (for example, a dynamic node provisioning algorithm [0073]) determines an average number of loss indication events (average packet loss rate [0073]) occurring outside of the data unit transmission device in the queued flow (in queues [0073]) as the characteristic count value (uses the count to compare with a threshold [0073]). It would have been obvious at the time of the invention for one of ordinary skill in the art to include the average number of loss indication events in the modified controller of Meyer et al in order to take into account a steadier, long term loss indication.

8. Claims 43 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al as applied to claims 42 and 60 above, and further in view of Kawaguchi (5,729,530).

Re claim 43, Meyer et al modified by Hadi Salim teaches the method of claim 42 as set forth above, but does not explicitly teach the step of monitoring sequence

identifiers of data units in the queued flow during the loss indication event detection procedure. However, Kawaguchi et al teaches of monitoring sequence identifiers of data units in (monitors the continuity of the sequence numbers) the queued flow (every connection [9, 30-40]) during the loss indication event detection procedure (through use of a cell discard detection signal and controlling circuit [9,37-45]). It would have been obvious for one of ordinary skill in the art at the time of the invention to include monitoring of sequence identifiers as taught by Kawaguchi in the method of the modified Meyer et al in order to account for packet losses outside the queue buffers.

Re claim 61, Meyer et al modified by Hadi Salim teaches the controller of claim 60 as set forth above, but does not explicitly teach the loss indication event detector comprising a monitor for monitoring sequence identifiers of data units in the queued flow during the loss indication event detection procedure. However, Kawaguchi et al teaches of monitoring sequence identifiers of data units in (monitors the continuity of the sequence numbers) the queued flow (every connection [9, 30-40]) during the loss indication event detection procedure (through use of a cell discard detection signal and controlling circuit [9,37-45]). It would have been obvious for one of ordinary skill in the art at the time of the invention to include monitoring of sequence identifiers as taught by Kawaguchi in the controller of the modified Meyer et al in order to account for packet losses outside the queue buffers.

9. Claims 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al as applied to claim 52 above, and further in view of Takada et al (2002/0089931).

Re claim 54, Meyer et al modified by Hadi Salim et al teaches the method of claim 52 as set forth above, but does not explicitly teach the steps of: discriminating data units to be queued on the basis of their contents in a discrimination and placing procedure; and placing data units into the first or the second queue in dependence on a discrimination result. However, Takada et al teaches of discriminating data units to be queued on the basis of their contents in a discrimination (class identifying) and placing (band monitoring) procedure (queue administrator identifies a queue corresponding to the class identifier, paragraphs [0167]-[0168] [0171]-[0172]) ; and placing data units into the first or the second queue in dependence on a discrimination result (stores the new packet in the subject queue according to the class identifier, paragraphs [0174][0188]). It would have been obvious for one of ordinary skill at the time of the invention in the area of controlling congestion in a network to include a discrimination of packets as taught by Takada et al in the method of the modified Meyer et al in order to provide different levels of service to different classes of packets.

10. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al in view of Takada.

Re claim 72, Meyer discloses the controller of claim 71 as set forth above, but does not explicitly teach a discrimination and placing unit for discriminating data units to

be queued on the basis of their contents and placing data units into the first or the second queue in dependence on a discrimination result. However, Takada et al teaches of a discrimination and placing unit for discriminating data units to be queued on the basis of their contents (class identifying) and placing (band monitoring) data units (queue administrator identifies a queue corresponding to the class identifier, paragraphs [0167]-[0168] [0171]-[0172]) into the first or the second queue in dependence on a discrimination result (stores the new packet in the subject queue according to the class identifier, paragraphs [0174][0188]). It would have been obvious for one of ordinary skill at the time of the invention in the area of controlling congestion in a network to include a discrimination of packets as taught by Takada et al in the controller of the modified Meyer et al in order to provide different levels of service to different classes of packets.

Response to Arguments

11. Applicant's arguments with respect to claims 48,53,58,59,66,71, and 72 have been considered but are moot in view of the new ground(s) of rejection.

12. Applicant's arguments with respect to claims 37-47,49-52,54-57,60-65,67-70 have been considered but are not persuasive.

Re claims 37 and 55, Applicant has stated that Meyer et al fails to disclose the element of :

> wherein the automatic threshold adaptation procedure is operable in one of at least a first and a second adaptation mode, the first adaptation mode being associated with minimizing queuing delay and adapting the threshold value on the basis of n*LC, where LC represents the estimated link capacity value and n>=1, and the second adaptation mode being associated with maximizing utilization and adapting the threshold value on the basis of m*LC, where m>1 and m>n.

Examiner respectfully disagrees. Meyer et al discloses wherein the automatic threshold adaptation procedure is operable in one of at least a first and a second adaptation mode. Examiner is interpreting this first and second adaptation mode as using two different thresholds which Meyer et al discloses in paragraph [0062]. Further, Meyer et al teaches the different "modes" accomplishing the same threshold calculations and outcomes as the claimed invention. Meyer et al discloses the first adaptation mode adapting the threshold value (in this case, using the minimum threshold) on the basis of n*LC (minimum threshold is calculated by setting equal to LC, therefore an arbitrary number of 1 could applied as n [0062]), where LC represents the estimated link capacity value (LC is calculated based on an estimated link capacity [0062]) and n>=1, and the second adaptation mode (in this case, using the maximum threshold) being adapted to the threshold value on the basis of m*LC, where m>1 and m>n (max threshold can be calculated from LC times a constant epsilon which can be from 3-6, therefore greater than 1 and greater than the above constant [0066]). Naturally, as Meyer et al discloses, when the QLav passes one of these thresholds, appropriate action is taken based on the threshold passed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL FIALKOWSKI whose telephone number is

(571)270-5425. The examiner can normally be reached on Monday - Friday 9:30am-7pm EST, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Ryman can be reached on (571)272-3152. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. F./
Examiner, Art Unit 2419

/Daniel J. Ryman/
Supervisory Patent Examiner, Art Unit 2419